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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/009,773	04/22/2002	Ermanno Filippi	Q67442	1574
23373	7590	08/27/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			KERNS, KEVIN P	
			ART UNIT	PAPER NUMBER
			1725	
DATE MAILED: 08/27/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/009,773	Applicant(s) FILIPPI ET AL.	
	Examiner Kevin P. Kerns	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 1-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/17/01 & 4/22/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "36" has been used to designate both intermediate ducts (Figures 2 and 3) and a closing cover (Figure 5). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

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The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because "The present invention relates to a" should be replaced with "A". Also, the legal terms "comprising" and "comprises" (in the 2nd and 12th lines, respectively) should be changed to "including" and "includes", respectively. Correction is required. See MPEP § 608.01(b).

4. The disclosure is objected to because of the following informalities: on page 12, line 29, "o" should be changed to "or" after one". In addition, there are numerous European spellings of terms (e.g. vaporisation, realise etc.) throughout the specification. Corrections and/or clarifications are required for these and any spelling/grammatical errors that occur throughout the specification.

Claim Objections

5. Claims 1-10 are objected to because of the following informalities: in claims 1-10, the term "characterised" should be changed to "characterized" in all instances. In claim 1, line 19, "axis (2)" should be changed to "(2) axis" after "shell". In claim 2, 2nd line, "comprises also" should be changed to "also comprises". Appropriate correction is required.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1, 3, 4, 6, and 10 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of copending Application No. 10/013,662 (analogous to US 2002/0085969) in view of Lahne et al. (US 4,339,413).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed reactor includes an outer shell of substantially cylindrical shape; at least one catalytic bed provided in the shell and comprising opposed perforated side walls; at least one tube passing through the at least one catalytic bed for passage of a cooling or heating fluid (serving as a heat exchanger); and a plurality of tubes arranged in at least one catalytic bed at a variable distance between adjacent tubes and are overlaid and connected at respective free ends at a duct, such that the at least one tube extends as a coil, preferably in the shape of a spiral, with the spiral having a winding pitch that

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varies as the radius of the spiral varies. One of ordinary skill in the art would have recognized that the structural features that include a coil/spiral with a winding pitch that varies as the spiral radius varies would form a cone shaped helicoidal, rather than a cylindrical helicoidal structure, and it would have been obvious to include one or more of the tubes that extend along a plane substantially perpendicular to the side walls, since the inwardly spiraling arrangement of tubes are substantially perpendicular to the reactor shell walls, for the purpose of extending the heat exchange to cover nearly the entire width of the reactor shell, thus obtaining improved cooling. Application No. 10/013,662 does not disclose the plurality of tubes superimposed with each other and connected at respective connecting portions.

However, Lahne et al. disclose a methanol-synthesis reactor, in which the reactor includes a vertical outer cylindrical shell 2; a catalyst bed 4 within the shell; and an array 5 of helical tubes extending in a concentric arrangement with overlaid (side-by-side --see Figure 6) tube layers (21,22) through the catalyst bed 4 for passage of heating/cooling fluid, with the plurality of helical tubes connecting to a common manifold 8a (connecting portion) via tube sections (23,24) and extending along a horizontal plane that is substantially perpendicular to the side walls, such that the superimposed plurality of helical tubes is advantageous for obtaining a substantially uniform temperature distribution throughout the catalyst bed (abstract; column 1, lines 67-68; column 2, lines 1-68; column 3, lines 1-45; column 4, lines 3-68; column 5, lines 1-31; and Figures 1-6).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the reactor disclosed in Application No. 10/013,662, by adding the array of helical tubes extending in a concentric arrangement with superimposed tube layers that connect to a common manifold via corresponding tube sections, as taught by Lahne et al., in order to obtain a substantially uniform temperature distribution throughout the catalyst bed (Lahne et al.; column 3, lines 8-31; and column 4, lines 28-31).

This is a provisional obviousness-type double patenting rejection.

8. Claims 1, 3, 4, 6, and 10 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. 10/009,783 in view of Lahne et al. (US 4,339,413).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed reactor includes an outer shell of substantially cylindrical shape; at least one catalytic bed provided in the shell and comprising opposed perforated side walls; at least one tube passing through the at least one catalytic bed for passage of a cooling or heating fluid (serving as a heat exchanger); and a plurality of tubes arranged in at least one catalytic bed at a variable distance between adjacent tubes and are overlaid and connected at respective free ends at a duct, such that the at least one tube extends as a spiral, coil, or alike wrapping around a portion of the side wall (serving as a modular unit in the embodiment of at least two tubes wrapping around a portion of the side

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wall). One of ordinary skill in the art would have recognized that the structural features that include a spiral, coil, or alike wrapping around a portion of the side wall would form a cone shaped helicoidal or a cylindrical helicoidal structure, depending on the shape of the outer shell of the reactor, which is known in the art to be cylindrical and conical, and it would have been obvious to include one or more of the tubes that extend along a plane substantially perpendicular to the side walls, since the inwardly spiraling arrangement of tubes are substantially perpendicular to the reactor shell walls, for the purpose of extending the heat exchange to cover nearly the entire width of the reactor shell, thus obtaining improved cooling. Application No. 10/009,783 does not disclose the plurality of tubes superimposed with each other and connected at respective connecting portions.

However, Lahne et al. disclose a methanol-synthesis reactor, in which the reactor includes a vertical outer cylindrical shell 2; a catalyst bed 4 within the shell; and an array 5 of helical tubes extending in a concentric arrangement with overlaid (side-by-side --see Figure 6) tube layers (21,22) through the catalyst bed 4 for passage of heating/cooling fluid, with the plurality of helical tubes connecting to a common manifold 8a (connecting portion) via tube sections (23,24) and extending along a horizontal plane that is substantially perpendicular to the side walls, such that the superimposed plurality of helical tubes is advantageous for obtaining a substantially uniform temperature distribution throughout the catalyst bed (abstract; column 1, lines 67-68; column 2, lines 1-

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68; column 3, lines 1-45; column 4, lines 3-68; column 5, lines 1-31; and Figures 1-6).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the reactor disclosed in Application No. 10/009,783, by adding the array of helical tubes extending in a concentric arrangement with superimposed tube layers that connect to a common manifold via corresponding tube sections, as taught by Lahne et al., in order to obtain a substantially uniform temperature distribution throughout the catalyst bed (Lahne et al.; column 3, lines 8-31; and column 4, lines 28-31).

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 1, 4, 6, and 10, it is unclear from the format of these claims whether the limitation "a spiral, a coil or alike" includes structures that would be more broadly interpreted than either a spiral or a coil. For example, could "alike" also mean a concentric, unconnected series of tubes? The term "alike" should either be deleted or replaced with a specific structural term.

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Claim 1 recites the limitation "the previous one". There is insufficient antecedent basis for this limitation in the claim.

With regard to claim 7, it is unclear what is meant by "variation of the position from flat to conical of the spirals". Does this suggest that the spirals are altered in a manner similar to an accordion?

With regard to claim 8, it is unclear what is meant by "quick clutching".

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-6, 9, and 10 insofar as definite (in view of the lack of a translation of the German document) are rejected under 35 U.S.C. 102(b) as being anticipated by Ruppel et al. (EP 0 534 195).

Ruppel et al. disclose an internally cooled catalyst bed reactor, in which the reactor includes a vertical outer cylindrical shell; a catalyst bed 1 within the shell, such that the shell contains perforations in the opposed sides walls that include helical pipes 3; a central duct and a plurality of connecting ducts; and tubes extending in the form of a spiral-shaped coil through the catalyst bed for passage of heating/cooling fluid, with some of the tubes extending along a

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horizontal plane that is substantially perpendicular to the side walls (abstract; and Figures 1 and 2).

13. Claims 1-6, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Lahne et al. (US 4,339,413).

Lahne et al. disclose a methanol-synthesis reactor, in which the reactor includes a vertical outer cylindrical shell 2; a catalyst bed 4 within the shell; and an array 5 of helical tubes extending in a concentric arrangement with overlaid (side-by-side --see Figure 6) tube layers (21,22) through the catalyst bed 4 for passage of heating/cooling fluid, with the plurality of helical tubes connecting to a common manifold 8a (connecting portion) via tube sections (23,24) and extending along a horizontal plane that is substantially perpendicular to the side walls, such that the superimposed plurality of helical tubes is advantageous for obtaining a substantially uniform temperature distribution throughout the catalyst bed (abstract; column 1, lines 67-68; column 2, lines 1-68; column 3, lines 1-45; column 4, lines 3-68; column 5, lines 1-31; and Figures 1-6).

14. Claim 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Brants (GB 1 270 568).

Brants discloses a modular heat exchanger, in which the heat exchanger includes a vertical outer cylindrical shell, such that the shell contains helical coils; a central duct and a plurality of connecting ducts; and tubes extending in the form of a spiral-shaped coil for passage of heating/cooling fluid, with some of the

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tubes extending along a horizontal plane that is substantially perpendicular to the side walls (page 1, lines 38-71 and 90-96; page 2, lines 1-130; page 3, lines 1-14; and Figures 1 and 2).

Allowable Subject Matter

15. Claims 7 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: insofar as can be understood (see 35 USC 112, 2nd paragraph section above), the prior art fails to teach or suggest a reactor that includes a basket-shaped structure comprising rays for support of the spirals having opposed ends hinged to rod-like uprights to enable a variation of the spiral position from flat to conical (dependent claim 7).

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Houdry, Zanma et al., Jezl et al., and GB 2 204 055 references are also cited in PTO-892.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number

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is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns *Kern/Kerns 8/29/04*
Examiner
Art Unit 1725

KPK
kpk
August 24, 2004